

We claim:

1. An area array package, comprising:
a substrate having a die attach area for mounting a die to the substrate, the die having a plurality of bond pads;
at least one bond island located on the substrate; and
at least one bond wire for connecting at least one bond pad to at least one bond island.
2. The area array package of claim 1, further comprising an encapsulant for environmentally protecting the package.
3. The area array package of claim 1, further comprising a trace for coupling at least one bond island to a package lead located on one side of the substrate.
4. The area array package of claim 1, further comprising a via for coupling at least one bond island to the package lead.
5. The area array package of claim 3, wherein the die attach area is located on a side of the substrate that is opposite the side of the package lead.
6. The area array package of claim 3, wherein the package lead is a solder ball included in a ball grid array (BGA).
7. The area array package of claim 3, wherein the package lead is a land included in a land grid array (LGA).
8. The area array package of claim 1, further comprising at least one bond finger for coupling a bond wire between at least one bond finger and at least one bond pad.

9. The area array package of claim 8, further comprising a trace for coupling the bond finger to a package lead.

10. The area array package of claim 8, further comprising a via for coupling the bond finger to a package lead.

11. The area array package of claim 1, wherein the substrate comprises a plurality of die attach areas for mounting a plurality of die.

12. The area array package of claim 1, wherein the substrate is a laminate substrate.

13. The area array package of claim 1, further comprising a plurality of solder balls connected to the bond islands, the plurality of solder balls being located inwardly from an edge of the substrate; and at least one redundant solder ball to allow a path for the inner solder balls connected to bond islands to be electrically plated.

14. The area array package, comprising:

- a substrate;
- a die attach area located on a surface of the substrate for mounting a die;
- a plurality of bond fingers patterned on the substrate for terminating a plurality of bond wires;
- a plurality of bond islands patterned on the substrate for terminating a plurality of bond wires; and
- a plurality of bond wires coupled between one of the plurality of bond fingers and a bond pad located on a top surface of the die.

15. The area array package of claim 14, further comprising an enclosure for enclosing the package

16. The area array package of claim 14, further comprising a plurality of solder balls that form a ball grid array (BGA).

17. The area array package of claim 16, wherein at least one of the plurality of solder balls is electrically coupled to one of the plurality of bond islands..

18. The area array package of claim 14, further comprising a plurality of lands that form a land grid array (LGA).

19. The area array package of claim 18, wherein at least one of the plurality of lands is electrically coupled to one of the plurality of bond islands.

20. An area array package, comprising;
a substrate;
means for attaching a die to a surface of the substrate
means for electrically coupling a bond island on the substrate to a bond pad located on the die; and
means for enclosing said package.

21. The area array package of claim 20, wherein the electrical coupling means comprises a plurality of bonding wires.

22. The area array package of claim 20, further comprising means for electrically coupling a bond finger on the substrate to the bond pad.

23. The area array package of claim 22, wherein the means for electrically coupling the bond finger to the bond pad comprises a plurality of bonding wires.

24. The area array package of claim 23, wherein the means for attaching a die further includes a means for attaching multiple die.

25. A method for making a high pin-count die, comprising the steps of :
providing a substrate;

forming a die attach area onto the substrate for mounting a die, the die having at least one bond pad;

locating at least one bond island onto the substrate, and

connecting the bond pad to the bond island with a wire bond.

26. The method of claim 25, further comprising the step of encapsulating the die.

27. The method of claim 25, further comprising forming a trace between the bond island and a package lead located on the substrate.

28. The method of claim 27, wherein the package lead is a solder ball included in a ball grid array (BGA).

29. The method of claim 27, wherein the package lead is a land included in a land grid array (LGA).

30. The method of claim 25, further comprising the step of depositing a bond finger onto the substrate.

31. The method of claim 30, further comprising the step of bonding a wire between the bond finger and the bond pad.

32. The method of claim 30, further comprising the step of forming a trace between the bond finger and a package lead.

33. The method of claim 32, wherein the package lead is a solder ball included in a ball grid array (BGA).

34. The method of claim 32, wherein the package lead is a land in a land grid array (LGA).

35. The method of claim 25, further comprising the step of forming a plurality of die attach areas on the substrate for mounting a plurality of die.

36. A method for providing an area array package, comprising the steps of:
providing a substrate;
attaching one or more die to the substrate;
wire bonding the die to the substrate; and
encapsulating the wires and die on the substrate.

37. The method of claim 36, further comprising the step of coupling a plurality of solder balls to one of a plurality of bond islands located on the substrate.

38. The method of claim 37, further comprising the step of coupling a plurality of bond fingers located on the substrate to the solder balls or the bond islands.

39. A method of designing an area array package comprising the steps of:
determining a die size and I/O count;
laying out an in-line bond finger array;
determining a maximum wire length for bond fingers located at the corner of a substrate;

determining the number of bond fingers that need to be staggered to meet a maximum wire length constraint or to improve performance of the package;

enlarging staggered bond fingers to create bond islands; and

laying out a solder ball configuration for optimal location of the bond fingers, bond islands or vias to create ease of routing of trace placements.